

**Plant Gene Register**

# A cDNA Encoding S-Adenosyl-L-Methionine Synthetase from Poplar<sup>1</sup>

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Adomet synthetase (EC 2.5.1.6) catalyzes the formation of Adomet, which serves as a methyl group donor in highly specific transmethylation reactions involving all kinds of acceptor molecules such as proteins, nucleic acids, phenylpropanoid derivatives, polysaccharides, cyclic fatty acids, etc. Adomet also plays a role in amino acid biosynthesis and polyamine biosynthesis. In plants, Adomet has been studied mainly in relation to the biosynthesis of various phenylpropanoid derivatives and as an intermediate in the biosynthesis of the phytohormone ethylene (Goodwin and Mercer, 1983). To date, cDNA or genomic clones encoding Adomet synthetase have been isolated from *Arabidopsis thaliana* (Peleman et al., 1989), parsley (Kawalleck et al., 1992), rat (Horikawa et al., 1989), *Saccharomyces cerevisiae* (Thomas and Surdin-Kerjan, 1987), and *Escherichia coli* (Markham et al., 1984). In *Arabidopsis*, tissue-specific Adomet synthetase gene expression was shown (mainly in vascular tissue), and it was suggested that Adomet synthetase gene expression is correlated with lignin biosynthesis (Peleman et al., 1989). In parsley and alfalfa cells, Adomet synthetase gene expression was induced in response to fungal elicitor and yeast cell walls, respectively (Gowri et al., 1991; Kawalleck et al., 1992). Here we report on the isolation of a poplar (*Populus deltoides* × *Populus trichocarpa*) cDNA for Adomet synthetase.

A poplar leaf cDNA library was screened using the *A. thaliana sam1* cDNA clone (Peleman et al., 1989) as a probe. A cDNA clone, designated *sam.PdxPt.2* (Table I) and containing a 1435-bp insert, was sequenced. The cDNA contains one open reading frame of 1185 nucleotides encoding a protein of 395 amino acids (calculated mol wt 43,271; isoelectric point 5.48). The coding region is flanked on the 5' end by 60 bp of noncoding sequence and on the 3' end by 190 bp. No in-frame stop codons were found upstream from the ATG (positions 60–62). The poplar Adomet synthetase has 90, 91, 92, 60, 59, and 49% similarity on the protein level

**Table I.** Characteristics of cDNA *sam.PdxPt.2* from poplar

Organism:	Poplar ( <i>Populus deltoides</i> × <i>Populus trichocarpa</i> ), clone 064 (Afocel, France).
Techniques:	Library screening; plasmid sequencing.
Method of Identification:	Sequence homology with Adomet synthetase from <i>A. thaliana</i> , parsley, rat, <i>S. cerevisiae</i> , and <i>E. coli</i> .
Expression Characteristics, Regulation:	Transcript of 1.6 kb detected in plants by RNA gel blots (our unpublished results).
Gene Copy Number:	Small multigene family (one or two genes) (our unpublished results).

with the Adomet synthetase from rice (F. Van Breusegem, personal communication), *Arabidopsis* (Peleman et al., 1989), parsley (Kawalleck et al., 1992), rat (Horikawa et al., 1989), *S. cerevisiae* (Thomas and Surdin-Kerjan, 1987), and *E. coli* (Markham et al., 1984), respectively.

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Abbreviation: Adomet, S-adenosyl-L-methionine.

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